The withdrawal of EU sugar preferences and the bittersweet reform pill for Fiji

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The phased removal of European sugar preferences has cast a dark cloud over the sustainability of Fiji's sugar industry. Using farm-level data, this article examines the extent to which Indo-Fijian farmers are technically efficient and the challenges faced in improving cane yields to offset the loss of EU preferences. It is shown that more efficient use of the same resources, technology and farming techniques could lead to a 24 per cent increase in cane output.

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Although Fiji is a small producer of sugar cane in global terms—contributing less than 1 per cent of world sugar output—the industry has been the backbone of the economy since the late 1950s. Since 1975, Fiji has had preferential access to the countries of the European Union at prices up to three to four times the world sugar price. The preferential pricing is, however, being phased out under pressure from the World Trade Organization (WTO).

The preferential access has been of great value to Fiji in terms of providing high and stable export earnings. For instance, in 2001, 74 per cent of Fiji's total sugar exports went to the European Union for €55 million, constituting about 3 per cent of Fiji's gross domestic product (GDP) (Levantis et al. 2005). In the absence of the preferential market, Fiji will have to sell its produce in the lower-priced world sugar market in competition with other producers. The economic viability of the industry will depend on its ability to increase efficiency and compete effectively for market share. As Fiji's sugar industry is highly vertically integrated, cane production, harvesting, transportation, milling and marketing are interdependent and therefore improving efficiency requires integrated sugar reform, making it a highly delicate and complex issue to manage.

Using more recent survey data, this study updates the analysis of Reddy and Yanagida (1999) to evaluate the efficiency of cane farm production and determine the impact of farming practices and other socioeconomic factors on efficiency. Hope-

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fully, this information will be used to help formulate policies to improve farm production efficiency. Other factors affecting farm efficiency, such as land insecurity, transportation and extension services, and institutional inefficiencies, are also discussed to provide a broad view of how the efficiency of the sugar industry as a whole can be improved.

Sugarcane farming in Fiji

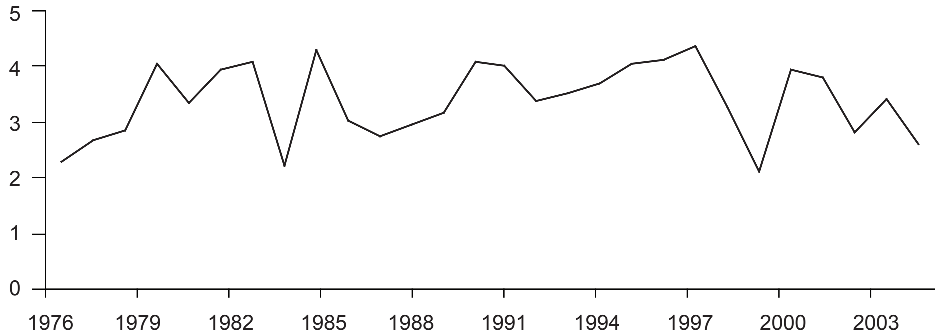
Cane farming in Fiji is characteristically a family-owned, farmer-operated enterprise and thus farming behaviour is not strictly what one would expect from a business enterprise. This feature has remained intact during the past three-quarters of a century and this distinguishes the Fijian sugar industry from that of many other sugar-producing countries, in which production is on plantations owned by the millers and to a lesser extent by independent growers on relatively large farms. In Fiji, the independent growers produce nearly all the sugar cane, on farms averaging 4.5 hectares. Directly and indirectly, about 250,000 people—or one in three people—in Fiji derive their income from this industry.

In terms of developments in output and area harvested, cane output varies quite sharply from year to year, partly due to the considerable variability in weather, including extreme events such as cyclones and droughts (Figures 1 and 2).

While the cane area harvested has increased by about 30 per cent in the past 30 years, cane yield (cane production per hectare harvested) has remained stagnant. One reason for this was that the most suitable land had already been developed, but the high cane prices received from the European Union attracted cane farmers to expand into areas of poorer soil quality or into areas located further from the mills (Grynberg 1995). The new land is more marginal in terms of economic viability, requiring greater physical and financial inputs such as irrigation, fertiliser, soil conditioners and higher transportation costs to maintain productivity and profitability (Grynberg 1995).

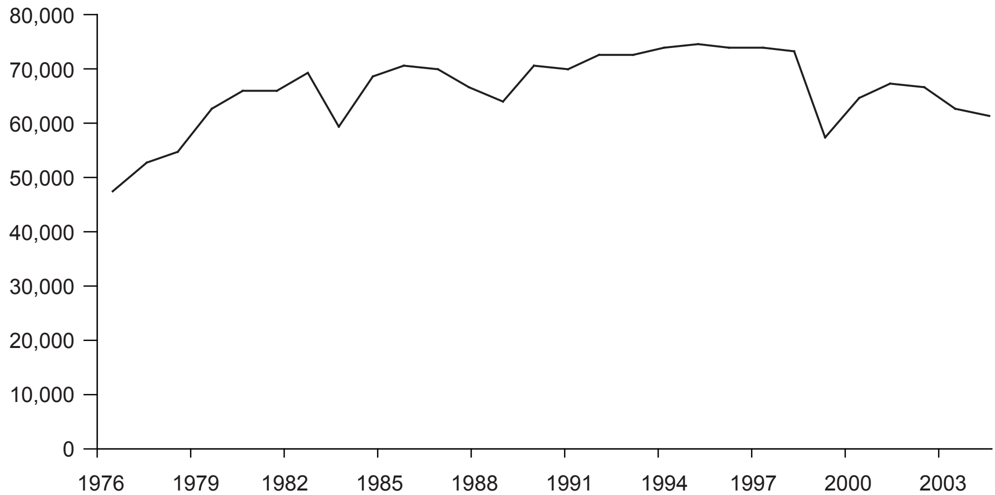
Another problem most cane farmers face is uncertainty and insecurity over the renewal of leases of land used for cane production. Between 1997 and the end of 2005, some 5,485 agricultural leases expired, of which 75 per cent were sugarcane leases. Between 1997 and 2003, only 20 per cent of the expired cane leases were renewed to sitting tenants, while 50 per cent were given to new tenants (NLTB 2003; Sugar Cane Growers Council 2003). To some extent, the low renewal rate was due to the slow response of the government in processing land lease applications.[1] The motivation for offering leases to new tenants is, however, to some extent reflected in the willingness of the new tenants to make a one-off goodwill payment—which can be quite substantial in some cases, amounting to F$1,000 an acre (Government of Fiji 2006)—whereas the sitting tenants are less likely to make such a payment. Nevertheless, many new tenants are not satisfied with the goodwill payment as the price is determined by the Native Lands Trust Board (NLTB) and the funding is paid through the farmer assistance scheme. Thus, new tenants lose up to half of the money provided through this scheme, which is meant to help establish new growers in the industry.[2] In reality, land tenure is a complex issue that remains too politicised for the consideration of simple and rational solutions.

Figure 1 **Cane produced** (million tonnes)



Source: Fiji Sugar Cane Corporation, various years. *Annual Report*, Fiji Sugar Cane Corporation, Lautoka.

Figure 2 **Cane area harvested** (hectares)



Source: Fiji Sugar Cane Corporation, various years. *Annual Report*, Fiji Sugar Cane Corporation, Lautoka.

Data and theoretical model

The data for this study[3] were obtained from a survey carried out in 2004 in the Nadi catchment, located in the western part of Viti Levu. The sample comprised 464 Indo-Fijian farmers randomly selected from the records of the Fiji Sugar Corporation for a face-to-face interview. The definitions of the variables used (Table 1) and some descriptive statistics of the variables (Table 2) are provided. On average, farmers with an average age of 52 years, who had spent eight years at school, farmed cane on 3.4 hectares of land (which was dedicated to cane production only). Although 81.5 per cent of them worked full-time on their farms, about 66 per cent had an alterative source of income. This is due in part to a significant majority of them (85 per cent) not owning their land and hence facing the possibility of the non-renewal of land leases.

The stochastic production frontier model

The stochastic production frontier model set out in Coelli, Rao and Battese (1998) was adopted for the analysis. The frontier concept emphasises the idea of maximality, which it embodies, and represents the 'best-practice' technique. The generalised version of the frontier model allows for a non-negative, random component in the error term to generate a measure of technical

Table 1 **Definition of variables**

Variable	Definition	Measurement
Production frontier model		
Y	sugarcane harvested	tonnes
LAN	area of farm	acres
LAB	total labour, including hired labour	hours
BULL	bullock labour	hours
TRACT	tractor use	hours
FERT	quantity of fertiliser applied	kilograms
WEED	quantity of weedicide used	litres
OTHER	land rent, drainage fee, and so on	F$
Inefficiency model		
AGE	age of farmer	years
EDU	years of schooling	years
DIST	distance from mill	kilometres
FSTAT	farming status	1 = full time, 0 = part time
OFFINC	off-farm income	1 = yes, 0 = no
TRANS	means of transporting cane to mill	1 = truck, 0 = rail
OWN	owns land	1 = yes, 0 = no
CLASS	class of land	1 = flat 2 = gentle 3 = quite steep 4 = marginal (steep)

Source: Author

inefficiency—the ratio of real to expected maximum output, given inputs and the existing technology. The specification can be expressed formally by

$$Y_i = f(X_i, \beta)\, e^{v_i - u_i} \tag{1}$$

for Y_i (output), X_i (a vector of inputs) and β (a vector of parameters) to be estimated. The error term v_i is assumed to be independently and identically distributed as $N(0, \sigma_v^2)$ and captures random variation in output due to factors beyond the control of farms, such as variations in the weather. The error term u_i captures technical inefficiency in production, which it is assumed are firm-specific, non-negative random variables, independently distributed as non-negative truncations at zero. A higher value for u implies an increase in technical inefficiency. If u is zero, the farm is perfectly technically efficient. Following Battese and Coelli (1995)

$$U_i = \delta_0 + z_i \delta \tag{2}$$

defines an inefficiency distribution parameter for z_i, a vector of firm-specific effects that determines technical inefficiency, where δ is a vector of parameters to be estimated. The technical efficiency (TE) of the i^{th} firm can be defined as

$$TE_i = \text{realised output/frontier output} = e^{-u} \tag{3}$$

Based on the above, the following Cobb-Douglas model is estimated, using the FRONTIER 4.1 program (Coelli, Rao and Battese 1998).

Table 2 **Descriptive statistics**

Variable	Mean
Output of cane farm (tonnes)	94.71 (112.6)
Area of cane farm (acres)	8.92 (7.2)
Age of farmer (years)	52.22 (12.3)
Years of schooling	8.32 (3.4)
Distance from mill (km)	27.58 (6.53)
Percentage of farmers	
Full-time farming	81.5
Have alternative income	65.7
Cane transport by truck	50.4
Own land	16.4
First-class land	16.8
Second-class land	26.5
Third-class land	50.4
Fourth-class land	6.3
Sample size	464

Note: Standard deviation in parentheses.
Source: Author calculations

$$LnY_i = \beta_o + \beta_1 Ln\mathrm{LAN}_i + \beta_2\, Ln\mathrm{LAB}_i + \beta_3 Ln\mathrm{BULL}_i + \beta_4 Ln\mathrm{TRACT}_i + \beta_5 Ln\mathrm{FERT}_i + \beta_6 Ln\mathrm{WEED}_i + \beta_7 Ln\mathrm{OTHER}_i + u_i + v_i \tag{4}$$

for the i^{th} farm, and the technical inefficiency model as specified in Equation 2 is

$$u_i = \alpha_0 + \alpha_1\, Ln\ \mathrm{AGE} + \alpha_2\, Ln\ \mathrm{EDU} + \alpha_3 Ln\ \mathrm{DIST} + \alpha_4\ \mathrm{OFFINC} + \alpha_5\ \mathrm{FSTAT} + \alpha_6\,\mathrm{OWN} + \alpha_7\mathrm{CLASS} + \alpha_8\ \mathrm{TRANS} \tag{5}$$

All definitions of the variables are found in Table 2.

Empirical results

Before discussion of the results from the frontier estimation, we provide some justification of the estimated model, using a generalised likelihood ratio test (Table 3). The stochastic frontier presents an improvement on an ordinary least square (OLS) function only if technical inefficiency effects are present. The presence of technical inefficiencies is tested by the significance of the ratio of error variances given by γ from Equation 1 and the null hypothesis of no technical inefficiency is rejected. The Cobb-Douglas functional form of the frontier model is also tested for and found not to be rejected. Finally, the coefficients of the inefficiency model are all jointly significant, indicating that farm-specific variables influence technical inefficiency.

Next, we present the estimates of the input coefficients of the frontier model and the factors affecting technical inefficiency (Table 4). It is evident that, except for the 'Other expenditure' variable, most inputs are significantly different from zero at the 5 per cent level of significance. Tractor use, however, is weakly significant at the 10 per cent level. This is possibly because tractors can be used only on flat and slightly sloped terrain and are often more economical for large than small areas. The survey data revealed that only 50 per cent of land farmed was suitable for tractor use. Farmers mostly own and use bullocks instead. The 'Other expenditure' variable is made up mainly of land rent, and a closer look at the data shows that rent does not necessarily reflect the area leased for farming. Some farmers paid little rent for large plots, depending on when the lease was signed, while others had different arrangements with their landowner for the sharing of cane proceeds.

On average, the mean technical efficiency of the farmers is 77.2 per cent, which means that if inputs and technology are efficiently used, it is possible to increase output by about 23 per cent. The significance of the estimates in the inefficiency model points to the factors that can be changed to improve farm efficiency. It should be noted that a negative sign on a coefficient indicates that an increase in the value of the variable results in a decrease in inefficiency, as represented by u_i in Equation 5.

As expected, age and education positively impact on technical efficiency since older farmers are experienced and hence more knowledgeable about cane farming; and the more educated the farmer, the better understanding he has of good farming practices related to cane varieties, soil conservation measures and the appropriate use of fertilisers and weedicide. The class of land is negatively related to efficiency improvements because a higher class of land indicates that the land is more sloping and this raises cultivation costs and reduces the response rate from fertiliser application.

Full-time farming is seen to increase efficiency by allowing for learning-by-doing gains. Full-time farmers, however, might

Table 3 **Tests of null hypotheses for parameters in the stochastic frontier model**

Null hypothesis	χ^2 statistic	Critical value (at 5% level)	Decision
$\gamma = 0$	12.45	2.71	Reject H_0
$\beta_1\beta_2 = \beta_1\beta_3 = \ldots = \beta_6\beta_1 = 0$	3.83	32.67	Cannot reject H_0
$\gamma = \alpha_0 = \alpha_1 = \ldots = \alpha_8 = 0$	31.72	18.31	Reject H_0
$\alpha_1 = \alpha_2 = \ldots = \alpha_8 = 0$	27.55	15.51	Reject H_0

Sources: The critical value for the first test, which tests the null hypothesis of no inefficiency effects, is taken from Kodde, D.A. and Palm, F.C., 1986. 'Wald criteria for jointly testing equality and inequality restrictions', *Econometrica*, 54:1,243–8. Critical values for all other tests are obtained from the appropriate chi-square distribution.

Table 4 **Maximum likelihood estimates of model**

Variables	Parameters	Coefficients
Production frontier model		
Constant	β_0	2.018 (0.115)[a]
Land	β_1	0.63 (0.085)[a]
Labour	β_2	0.18 (0.069)[a]
Bullock hours	β_3	0.092 (0.013)[a]
Tractor hours	β_4	0.014 (0.008)[b]
Fertiliser use	β_5	0.038 (0.017)[a]
Weedicide use	β_6	0.022 (0.009)[a]
Other expenditure	β_7	0.021 (0.014)
Inefficiency model		
Constant	α_0	–1.367 (0.614)[a]
Age	α_1	–0.004 (0.002)[a]
Education	α_2	–0.008 (0.003)[a]
Distance from mill	α_3	0.007 (0.002)[a]
Off-farm income	α_4	1.213 (0.608)[a]
Full-time farming	α_5	–2.127 (0.983)[a]
Own land	α_6	–1.804 (0.915)[a]
Class of land	α_7	0.963 (0.488)[a]
Transport by truck	α_8	–1.041 (0.507)[a]
Variance parameters		
	σ^2	0.045 (0.013)
	γ	0.921 (0.074)
Log likelihood		83.62
Mean efficiency	0.772	
Total sample	464	

[a] indicates the coefficient is significant at the 5 per cent level
[b] indicates the coefficient is significant at the 10 per cent level
Note: Figures in parentheses are standard errors.
Source: Author calculations

have an alternative source of income, as the data reveal that 60 per cent of full-time farmers have off-farm income. If this income is substantial, farming might be a secondary interest and thus adversely affects incentives to improve efficiency. On the other hand, this additional income might be used to buy farm implements or hire labour for farming, thereby increasing efficiency. The positive coefficient on off-farm income shows that the latter is not the case. This is in part due to land insecurity and the uncertain prospects facing the sugar industry due to the withdrawal of the European Union's price subsidy.

Land tenure insecurity is one of the unresolved political problems plaguing the Fijian sugar industry. This belief is reinforced to some extent by the ownership dummy variable having a negative coefficient, indicating that tenant farmers are less efficient than those who farm land they own.[5] The insecurity and risk with regard to land leases have led to falling confidence in the industry; and this has depressed farm investments and led to poor access to credit (Fiji Development Bank 2003). This understanding was confirmed by 97 per cent of the farmers who were surveyed.

Another problem faced by cane farmers is the inefficiency of the government-run Fiji Sugar Corporation (FSC) rail system that is used to transport harvested cane to the mills. This system has steadily deteriorated because of under-investment in rail maintenance; the locomotives are old, face high repair bills and hence frequently break down (Davies 1998). The Sugar Technology Mission (2004) recommended that the rail system be abolished, as improving the current system would require F$12 million a year.

Farmers also transport their cane by truck. The coefficient of the dummy on truck use indicates that road transport improves technical efficiency due to better control over the timing of cane pick-up and timely delivery to the mills. The cost incurred in hiring trucks is, however, not borne by the FSC unless farmers can prove that it is not possible to use rail. Regardless of the mode of transport, the further the farm is from the mill, the lower will be the efficiency level, as seen from the α_3 coefficient in Table 4.

Farm profiles by efficiency rankings

Using the farm-level measures of technical efficiency together with the broader set of farm inputs in the survey data set provides a useful (overall) profile of sugarcane farms by efficiency ranking. Efficiency does vary considerably among farmers—from 63 to 97 per cent—and for convenience the efficiency rankings are arbitrarily divided into 'low' (63–76 per cent), 'medium' (77–89 per cent) and 'high' (more than 90 per cent) (Table 5). Caution must be taken with the interpretation of the results since the correspondence of farm input use with high or low efficiency levels might be coincidental and not causal. Nevertheless, a number of points arise from differences in the quantity of inputs used.[6]

Large farms use more bullocks and labour, as expected, and they also have the highest efficiency levels—possibly because of economies of scale (Table 5). Interestingly, small farms with an average size of 2.6 hectares had higher efficiency levels than the medium-sized farms averaging 3.9 hectares. The test for the differences between the two means in all the efficiency groups for land size is statistically significant at the 5 per cent level. Tractor use was insignificant for all three groups and was found to be only weakly significant in raising output (Table 4). Medium-performing farms use the highest levels of weedicide and fertiliser; however, these inputs are not used efficiently when combined with other inputs. One reason could be the lack of knowledge of the types of fertiliser that need to be applied, how much to apply and the timing

Table 5 **Farm inputs, by efficiency groupings**

Average value of farm inputs	Efficiency of farm group		
	Low (63–76%)	Medium (77–89%)	High (90% and above)
Land area (acres)	9.7	6.5	13.5
Land quality (1 = flat to 4 = marginal)	2.9	3.1	3.2
Fertiliser use (kg/acre)	97.5	178.5	163.6
Weedicide use (L/acre)	19.5	30.35	32.7
Total labour hours per acre	111.2	108.3	127.3
Bullock hours per acre	38.6	44.5	55.4
Tractor hours per acre	19.1	22.1	25.4

Source: Author calculations

of applications. Also, high use of weedicide and fertiliser could reflect risk-averse action to ensure healthy crop production.

Another worthwhile observation is that high performers are producing on slightly lower-quality land than others—meaning that using more inputs or better-quality land does not necessarily result in more efficient production. A useful extension of this analysis would be to examine measures of allocative efficiency, since getting the right mix of different inputs is a difficult but important task that greatly affects the cost of production. Unfortunately, the survey data do not contain price information and hence are not readily amenable to estimates of a stochastic cost frontier.

The less-than-sweet solution

The phasing-down of the European Union's preferential sugar prices has placed enormous pressure on Fiji's sugar industry to improve its competitiveness in the global market. The empirical analysis shows that 23 per cent more output can be produced using the same resources and technology—that is, without any changes in farming practices or reforms in the institutional arrangements and facilities in the sugar mills. If these areas can be sufficiently improved, there is little doubt that the significant benefits that the sugar industry will enjoy will strengthen and sustain the industry's survival.

The evidence in Table 5 indicates that large farms are the most efficient and are commercially more viable than others. Furthermore, it is easier for large farms to secure loans from financial institutions to invest in farm improvements. On the other hand, many small-farm households face the prospect of being forced out of farming and of experiencing financial difficulties. Given the high likelihood of eviction that these farmers face after their lease expires, this presents an opportunity for amalgamating land leases to form larger holdings. The evicted farmers could be employed on the large farms and be paid a reliable wage.

The insecurity of land tenure that has existed since 1997 must be resolved urgently. Resolution requires adopting an efficiently operating market that allows access to land on the basis of a transparent and enforceable system of rules; this is critical for investment and growth in the broader economy (World Bank 2002). None of the many suggestions made to solve the problem has yet been considered, including sharecropping (Otsuka, Chuma and Hayami 1992), the master lease arrangement whereby the government leases land from native landowners and subleases it to tenants to minimise administrative costs for the NLTB (ADB 2005), and the call for a regulatory agency charged with the responsibility of providing arm's-length supervision of a market-driven process that allows landowners to make their land available to investors (Chand 2004). The problem lies in the fact that political parties in Fiji have been more interested in using the debate over land leases as a means of supporting their own interests than resolving it to facilitate economic development.

To improve land efficiency, given that a majority of the land under cane is not of good quality, several best farming practices should be followed. These include measures to prevent soil erosion, to encourage adequate and timely fertiliser and weedicide application (a possible problem, as noted from Table 5) and control of diseases. Thus, government intervention in the form of allocating more funds for research into crop management and protection and improvement, as well as extension services to ensure that the information reaches farmers, must be a top priority. In this regard, the effort by the Fijian Government to establish an independent sugar research institute, effective from 1 October 2006, is a step in the right direction and it is hoped that it will be staffed by well-qualified people. The institute will also be recruiting 28 extension officers to cover 600 growers for each officer (Government of Fiji 2006).

Using plant cane also enhanced land efficiency, but more than 90 per cent of those surveyed used ratoon cane older than four years, while only 5 per cent used younger ratoon cane.[7] Although use of ratoon cane adversely affects cane yield, it is cheaper to grow, as farmers save on the cost of buying and planting seed cane. As growers are paid based on the weight of cane delivered to the mills, rather than the sugar yield from the cane, farmers are not discouraged from burning cane to remove weeds, creepers and dead leaves before harvesting. While cane burning is not in itself a bad practice, excessive cane burning is a problem in Fiji (the percentage of burnt cane of the total cane crushed in 2003 was 33.4 per cent), adversely affecting soil fertility and cane quality (Sugar Technology Mission 2004).

The survey revealed that a majority of the farmers burnt cane if they believed that they could not get their harvested cane to the mills before the end of the crushing season. Also, there is an incentive to burn as burnt cane is given priority in transportation to the mills to prevent quick deterioration in cane quality. The farmers admitted that the penalty for delivering burnt cane was not enough to deter burning.

Another way to improve cane yield and quality is crop improvement through the use of improved cane varieties, giving higher sugar yields and better resistance to diseases and pests. The survey revealed that less than 8 per cent of farmers used more than one cane variety while at least 90 per cent of the farmers used the Mana variety, which had more weight but less sugar content and was cheaper than other varieties. It can also be ratooned for longer periods, but this increases the chances of disease and infection of the cane stalk. In general, farmers are not aware of the newer, improved varieties such as Naidiri and the early maturing Aiwa, which might be more suitable for certain soil types. A mix of cane varieties can be expected to improve allocative efficiency, leading to optimal cane output.

Farmers, however, are not to be blamed entirely for not adopting best management practices.[8] There has been no extension system in place since 2001 to help farmers in these practices, due to the financial constraints on the FSC. The corporation's largest shareholder is the Fijian Government, with 68 per cent of shares. The FSC manages and coordinates the activities of the rail transport to deliver cane from farms to the mills and undertakes cane milling and the production of raw sugar. In order for the sugar industry to be viable, these functions of the FSC must also be improved.

The FSC's maintenance of the rail transport system has been minimal and is said to be limited to emergency troubleshooting (Gill 2005). Of the 6,689 sugarcane tracks, 80 per cent are older than 40 years and only 30 per cent of the rail fleet is currently utilised (Gill 2005). Presently, transport costs by rail and road do not differ much, with F$10.67 a tonne for rail versus F$11.06 a tonne for road in the western sugar belt (Government of Fiji 2006). Given the huge costs of maintenance of the rail system, the government is seriously considering expanding road networks. This requires improving access tracks to sugarcane farms and also rural feeder roads for better connection to country and secondary roads. The Sugar Technology Mission (2004) found that in 99 per cent of the sugar sector there was a considerable gap between the scheduled and real time of transportation by rail. Such delays cause the quality of harvested cane to deteriorate rapidly, adversely affecting the amount of sugar that can be produced. Although the results suggest that the best practice would be to transport cane by road to reduce the operational cost of the mills and also to ensure fresh cane supply to the mills, the current road infrastructure cannot support this venture. Thus, more needs to be done with respect to road and rail infrastructure to better manage cane transport.

The FSC owns all four mills in Fiji, which have been operating well below capacity in most years, processing an average of 3.5 million tonnes of cane annually to produce about 400,000 tonnes of sugar when they have the capacity to produce 500–550,000 tonnes of sugar (Landell Mills International 2002). While the poor recovery of sugar cannot be attributed to mill performance alone (as their performance depends on the quality and timely delivery of cane), there have been frequent breakdowns at the mills due to poor and irregular maintenance of mill equipment (ADB 2003). Although considerable investment in machinery and mill equipment has been made in the past decade, poor management and control have hindered gains in efficiency (ADB 2003). Factory costs have increased to a point where Fiji has gone from being ranked the third-most efficient sugar producer in the world, ahead of Australia, to now being ranked twenty-eighth, with factory costs almost 160 per cent those of Australia's (Landell Mills International 1991, 2002).

There is therefore much discontent among stakeholders in the sugar industry: the growers blame the institution's inefficiencies while the millers (in this case, the FSC and the government) blame the farmers for not supplying good cane in time. In reality, both parties need to work with each other or both will face huge losses: with no cane provided, the FSC will have to write off its investment in equipment and facilities for sugar production; and inefficient growers will have to exit the industry and face economic hardship if they are unable to find alternative means of survival.

The government has to seek a solution to the lack of secure property rights to land to create certainty for farmers so that production efficiency can be improved. Limited effort from the government in resolving the impasse over land leases in the sugar sector has also been due to the emphasis on industrialisation related to the promotion of other growth sectors such as tourism, retail, forestry and manufacturing, especially the garment industry (Chand 2004).

Conclusion

The call for reform of the sugar industry is more pressing than ever, given the phased loss of EU sugar preferences. The loss of preferences presents an ultimatum for the growers and millers to have a fruitful dialogue over strategies that will benefit them both in the long run. It is noteworthy that some progress was made towards this end, as spelt out in the *National Adaptation Strategy for the Fiji Sugar Industry* tabled in Parliament on 31 August 2006. Considerable funding in the form of a loan of F$86 million from the Indian Government has now been committed towards a restructuring of the sugar industry in various areas.

The Alternative Livelihood Project (2006–12) was counted on to provide F$97 million (of which 25 per cent was to be loaned from the Asian Development Bank and the rest funded by various Fijian institutions) for road repair and providing infrastructure to support agriculture in general. Finally, the European Union has promised to smooth the transition for Fiji and other African, Caribbean and Pacific countries necessitated by the EU sugar reforms. Fiji was allocated F$40 million for 2007 and a total of F$350 million (167 million) over eight years.[9]

Despite the gloom cast by the erosion of EU sugar prices, it is essential to turn Fiji's sugar industry around, particularly in view of its continued importance to the economy. Part of the success in doing so will depend on how effectively the available funds for reform are used to produce the best results for Fiji's sugar industry. While some critics might say that it is too late to salvage the ailing industry, one can argue that it is better late than never. So, yes, the near future does not look promising, as reform is always a difficult period; if properly managed, however, the pain can make possible a short-term path to gains in the long term.

Notes

1 For example, of a total of 1,062 applications for renewal as of the end of December 2003, only 449 applications were processed.

2 I thank a referee for drawing attention to this aspect.

3 The sample is not representative of all cane farmers in Fiji because it is location specific and does not include indigenous Fijian farmers. Thus, the results of this study are not relevant for farmers from other parts of Fiji, as is often the case with most sample-based studies. Readers interested in the impact of ethnicity on cane farm technical efficiency and input-specific technical efficiency can refer to a forthcoming paper by the author in the *Journal of Economic Studies*.

4 The off-farm income is based on whether the farmer has other sources of income and is not at the household level.

5 The significance of this coefficient might be influenced by the location of the sampled farmers close to Nadi, where there has been a much stronger resolve by landowners to retain the leases within the *mataqali*. I thank a referee for raising this possibility.

6 There was, however, no distinct pattern when the farm profiles were examined for the other independent variables.

7 Sugar cane can be propagated by planting sections of the stalk known as seed cane. Once the first crop, called plant cane, is harvested, the plant will grow back from the portion of the stalk left under the ground. The subsequent crops are known as ratoon crops.

8 These include soil preparation, seed production and treatment, weed control, fertiliser schedules, soil moisture management and soil conservation, plant protection, proper harvesting, ratoon management practices, variety and seasonal planting and financial management.

9 These funding initiatives have been stalled due to the political uncertainty brought about by the coup in December 2006.

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